PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of

Applicant	:	North et al.
Serial No.	:	09/772,708
Filed	:	January 30, 2001
Title	:	WELDING ELECTRODE AND METHOD FOR REDUCING MANGANESE IN FUME
Docket	:	483471-003
Examiner	:	Elve, Maria Alexandra
Art Unit	:	1725

Mail Stop Appeal Brief - Patents
Assistant Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPEAL BRIEF

This is an appeal from the Final Rejection mailed on December 4, 2002. A Notice of Appeal was submitted on April 3, 2003.

REAL PARTY IN INTEREST

This application is assigned to Illinois Tool Works, Inc. and the University of Toronto, as evidenced by the Assignment recorded on April 19, 2001 at Reel/Frame 011721/0869. Accordingly, Illinois Tool Works, Inc. and the University of Toronto are the real parties in interest.

RELATED APPEALS AND INTERFERENCES

The inventors, assignee and undersigned attorney are not aware of any appeals or interferences that would directly affect, be directly affected by, or have a bearing on the Board's decision in this appeal.

STATUS OF CLAIMS

Claims 1, 3-6 and 8-11 stand rejected. Claims 2 and 12-19 have been canceled. Claim 7 is allowed subject to an objection. Claim 7 is directed to the embodiment of the invention in which manganese is encapsulated in a layer of the shielding material.

STATUS OF AMENDMENTS

All amendments have been entered.

SUMMARY OF INVENTION

The manganese that is present in the fume that is generated during arc welding using cored electrodes containing manganese is reduced by incorporating the manganese into the electrode in the form of a composite particle that contains a shielding material. A shielding material is defined on page 2, line 5 of the application as a material that prevents the manganese from vaporizing and oxidizing. In one embodiment the shielding material is TiO_2 and more particularly rutile TiO_2. As the electrode melts during the welding operation, the shielding material is believed to prevent the manganese from vaporizing and oxidizing. As a result, more manganese resides in the weld deposit and less is present in the fume.

Importantly, when the electrode melts during the welding operation, the shielding material in the **composite particle** prevents the manganese from oxidizing which results in more manganese residing in the weld deposit and less manganese being present in the fume, thereby reducing the amount of manganese fume generated (page 2, lines 1-6 of application). In accordance with the invention by intimately associating manganese with a shielding material in the form of a composite particle, the manganese fume is reduced. In one embodiment, the manganese is encapsulated in a layer of a shielding material (e.g., as shown in Fig. 2 of application). In another embodiment of the **composite particle** is an agglomerate of manganese with the shielding material (shown in Fig. 3 of application).

ISSUES

The issues on appeal are:

(1) whether claims 1, 3-5, and 7-8 are anticipated under 35 U.S.C. §102(b)by Kulikowski et al.;

(2) whether claims 6 and 9-11 are obvious under 35 U.S.C. §103(a) over Kulikowski et al.;

GROUPING OF THE CLAIMS

For purposes of this particular appeal, the claims, with the exception of claim 7, can be considered together.

ARGUMENT

I. CLAIMS 1, 3-5, AND 7-8 ARE NOT ANTICIPATED BY KULIKOWSKI

Claims 1, 3-5, and 7-8 are rejected under 35 U.S.C. §102(b) as being anticipated by Kulikowski et al. The most basic premise underlying the rejection is: "If a composition is physically the same, it must have the same properties. A chemical composition and its properties are inseparable. Therefore the prior art teaches the same chemical composition, the properties of instant claims are necessarily present."

This premise is fundamentally flawed because the chemical composition claimed as applicants' invention is **not** the same as that disclosed by Kulikowski et al. Applicants' welding electrode contains a **manganese-containing composite particle** (discussed below), which is **not** present in Kulikowski. That composite particle contains a shielding material.

In accordance with the applicant's invention, in contrast to Kulikowski, manganese is **intimately associated** with a shielding material in the form of a **composite particles. Manganese is not present as a simple admixture**. For example, in one embodiment a blend of

manganese and titanium dioxide is dry blended for approximately 10 minutes in a mixing blender. After dry blending, sodium silicate (water glass) in liquid form is added to the dry blend to bind the materials together into composite particles (lines 4-7, pg. 5 of application).

As explained in the first full paragraph on page 4 of the application (lines 3-14), tests were performed with the same amount of manganese in the wire (2.32% of manganese by weight of the wire in each test), while adjusting the percentage of manganese-containing composite particles from 25% to 75% composite particles in the core composition with each respective test. As shown in Figure 4 of the application, as the amount of manganese containing **composite particle** in the core is increased (while keeping the total percentage of manganese by weight of the wire the same), the amount of manganese fume decreases up to 36%. Thus, Fig. 4 shows that by keeping the **amount of manganese in the wire constant**, but **incorporating more of the manganese in the wire in the form of composite particles as opposed to simple mixtures**, the **amount of manganese fume is reduced**. The reduction in fume is clearly attributable to the presence of **manganese-containing composite particles** in the core. By **intimately associating the manganese with the shielding material in a composite particle in this manner, manganese oxide vapor is reduced**. Kulikowski does **not** teach the use of a **composite particle** in **reducing manganese fume generation**.

In making the §102 rejection, the Office is not giving any patentable weight to the composite particle limitation of the claims. This is improper. The claim cannot be construed as reading on a simple admixture in which the manganese and the shielding material are not associated intimately as a composite particle. The data represented in Fig. 4 shows quite clearly that admixtures and composite particles are not equivalent. The applicants have discovered a key to using manganese in welding electrodes while minimizing manganese fume. A person of ordinary skill following Kulikowski is not going to achieve this result.

In summary, the applicants' invention clearly is not anticipated. Furthermore the applicants' invention clearly provides a unique reduction in the amount of a harmful agent in welding fume. The combined affect of these two showings justifies a reversal of the rejection.

In making the anticipation rejection the Office also states that Kulikowski et al. teaches a fill material which includes manganese (abstract & col. 2, lines 20-26) and also teaches low fume generation (col. 3, lines 28-41). The **low fume generation** taught in Kulikowski, however, is **not manganese fume but hydrogen fume**. More specifically, as described in Kulikowski, the **low fume generation** relates to a **low oxygen and low hydrogen content** resulting from the **chemical reaction with Teflon**. The Teflon (polytetrafluoroethylene) is disassociated to produce flourine, which then combines with hydrogen to produce hydrogen flouride, thereby reducing the amount of hydrogen fume (col. 6, lines 10-32). This process is entirely different from applicant's use of **composite particles** to reduce manganese fume. Kulikowski says **nothing about reducing manganese fume, nor does it say anything about a manganese-containing composite particle**. Furthermore, the **presence of manganese** in Kulikowski has **nothing to do with the low fume generation** taught in Kulikowski; it is the **incorporation of Teflon** which **leads to the low fume generation** as described above. In fact, the **mere presence of manganese alone** in applicant's invention **does not result in low fume generation either**; it is the incorporation of manganese into a **composite particle** in intimate association with a shielding material which results in the **reduction of manganese fume** as explained in the previous paragraph.

II. CLAIMS 6 AND 9-11 ARE NOT OBVIOUS

Claims 6 and 9-11 are rejected under 35 U.S.C. §103(a). In making this rejection as being obvious in view of Kulikowski et al., the examiner states that the prior art compositions closely approximate or overlap applicant's claimed composition in range. The applicant submits that these claims are patentable for the reasons already stated, namely, the manganese is closely associated with a shielding material in the form of a composite particle. There is no teaching of this in Kulikowski et al.

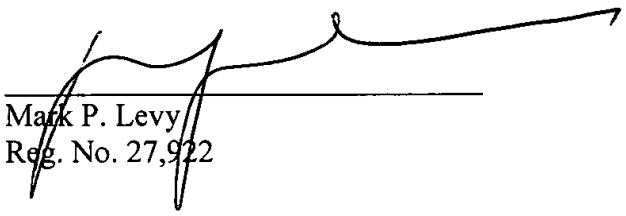
CONCLUSION

As argued above, the Final Rejection should be reversed because Kulikowski et al. does not teach the use of manganese-containing composite particles to reduce manganese fume nor

does Kulikowski et al. teach reducing manganese fume, Kulikowski et al. cannot teach or suggest the claimed invention and the rejection must fail.

Accordingly, the Applicant respectfully requests the Honorable Board of Patent Appeals and Interferences to reverse the examiner's rejections.

Respectfully submitted,



Mark P. Levy
Reg. No. 27,922

THOMPSON HINE LLP
2000 Courthouse Plaza NE
10 West Second Street
Dayton, Ohio 45402-1758
(937) 443-6949

APPENDIX - COPY OF PENDING APPEALED CLAIMS

1. A cored electrode for arc welding, said electrode having a core in which the fill material includes a manganese-containing composite particle wherein the composite particle contains manganese in admixture with a shielding material.

3. The electrode of claim 1 wherein the shielding material is TiO_2.

4. The eletrode of claim 3 wherein the shielding materials is rutile.

5. The electrode of claim 4 wherein the shielding material is anastace.

6. The electrode of claim 1 wherein the wire contains at least about 0.5% by weight manganese.

7. The electrode of claim 1 wherein the composite particle contains manganese encapsulated in a coating of said shielding material.

8. The electrode of claim 1 wherein the composite particle is made up of manganese particles dispersed in a matrix of the shielding material.

9. The electrode of claim 1 wherein the composite particle itself contains about 15 to 40% manganese based on total particle weight.

10. The electrode of claim 1 wherein the electrode is formulated for welding on mild steel and has the following composition in approximate percent by weight of the wire:

Constituent	**Mild Steel**
C	0.0-0.12
Mn	0.5-3.0
Si	0.0-2.0
Ti	0.05-0.7
B	0.0-0.1
Cr	0.0-0.4
Ni	0.0-0.5
Mo	0.0-0.1
V	0.0-0.5

Al	0.0-0.5
Cu	0.0-0.1
Mg	0.0-0.5
Fe	01.48-99.45

11. The electrode of claim 1 wherein the electrode is formulated for welding on low alloy steel and has the composition in approximate percent by weight of the wire:

Constituent	**Low Alloy**
C	0.0-0.13
Mn	0.5-3.75
Si	0.0-2.0
Ti	0.05-0.7
B	0.0-0.1
Cr	0.0-10.5
Ni	0.0-3.75
Mo	0.0-1.2
V	0.0-0.25
Al	0.0-0.5
Cu	0.0-0.75
Mg	0.0-0.5
Fe	75.87-99.45